

**WAP** → Wireless Access Point

- Power from :
  - Outlet
  - PoE (Power over Ethernet)

**CSMA/CA** → Carrier sense multiple access / collision avoidance

**RTS/CTS** → Request to Send / Clear to Send (lower performance, but avoids collisions)

### **Wireless Network Modes**

- **Ad-hoc mode**
  - Wireless “mesh”
  - Form an **Independent Basic Service Set (IBSS)**
  - Peer-to-peer mode
- **Infrastructure mode**
  - 1 or more WAPs
  - Form a **Basic Service Set (BSS)**
  - Additional WAPs create an **Extended Basic Service Set (EBSS)**

### **Wireless Networking Security**

- **4 methods:**
  - **Change default password on WAP**
  - **Configure Service Set Identifier (SSID)**
    - Turn off broadcasting
    - Change the default name
  - **Filter by MAC**
    - You may also blacklist MAC addresses
    - WAPs use ACL for authentication
  - **Use encryption**
    - **Wired Equivalency Privacy (WEP)**
      - 40-bit or 104-bit encryption
      - Authentication based on MAC
      - **Flawed**
    - **Wi-Fi Protected Access (WPA)**
      - Upgrade from WEP
      - Uses encryption key integrity-checking through **EAP** (Extensible Authentication Protocol)
      - RC4 encryption
      - Uses Temporal Key Integrity Protocol (TKIP), that provides a new key for every sent packet
  - **WPA2 (IEEE 802.11i)**
    - Upgrade from WEP and WPA
    - Uses AES encryption
  - **WPS (Wi-Fi Protected Setup)**
    - Devices sync to establish a secure connection
    - Hackeable

TABLE 1 : WLAN PHYSICAL LAYER EVOLUTION				
Year	Standard	Peak PHY rate (Mb/s) Including optional modes	Typical access point	Key technology
1997	802.11	2	2	Spread spectrum
1999	802.11b	11	11	CCK, spread spectrum
1999	802.11a	54	54	OFDM
2003	802.11g	54	54	OFDM
2009	802.11n	600	300-450	MIMO OFDM, wide bandwidth (40 MHz)
2013	802.11ac	6933	1300-3466	DL MU-MIMO, wide bandwidth (80 and 160 MHz)

### 802.11 Standards

#### Infrared

- Infrared Data Association (IrDA) protocol
- Line-of-sight required
- No encryption or authentication
- Max. 1m

#### Bluetooth

- PANs (Personal Area Networks)
- **Class :**
  - **1** : 100m
  - **2** : 10m
  - **3** : 1m

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#### References :

- Mike Meyers - CompTIA A+ Certification All-In-One Exam Guide 8th edition
- Images :
  - 802.11 Standards :
    - [http://mwrf.com/site-files/mwrf.com/files/uploads/2014/03/30E\\_table1.gif](http://mwrf.com/site-files/mwrf.com/files/uploads/2014/03/30E_table1.gif)